

What is claimed is:

- 1 1. A positioning apparatus for a towing vehicle having an attachment point
2 comprising:
3 a towing vehicle having an attachment point for attaching a towed item;
4 a 5th wheel encoder secured to the attachment point, the 5th wheel
5 encoder adapted to be in contact with the towed item;
6 a sensor on the 5th wheel encoder for determining an angular position of
7 the towed vehicle relative to the towed item; and
8 a device for receiving the relative angular position and transmitting
9 information on the relative angular position.
- 1 2. The positioning apparatus of claim 1, wherein the towing vehicle
2 comprises a rearview mirror and further comprising a device for actuating the
3 position of the rearview mirror based on the information on the relative angular
4 position.
- 1 3. The positioning apparatus of claim 2, wherein the position of the
2 mirror is actuated by a geared stepper motor.
- 1 4. The positioning apparatus of claim 3, wherein the receiving
2 device is a microprocessor for correlating the position of the rearview mirror to
3 the relative angular position.
- 1 5. The positioning apparatus of claim 1, further comprising a device
2 for notification of the relative angular position.
- 1 6. The positioning apparatus of claim 1, wherein the 5th wheel
2 encoder comprises a rotating device, the rotating device being adapted to sense
3 the relative angular position and to rotate in a direction and an amount
4 correlated to the relative angular position.
- 1 7. The positioning apparatus of claim 6, wherein the rotating device
2 is an actuating wheel mechanically coupled to an optical encoder, the optical
3 encoder being adapted to detect and transmit to the receiving device the
4 direction and amount of rotation of the actuating wheel.

1 8. The positioning apparatus of claim 7, further comprising a
2 microprocessor to receive the direction and amount of rotation, determine the
3 relative angular position, and transmit at least one of a signal to actuate a
4 rearview mirror of the towing vehicle and a signal to provide notification of the
5 relative angular position, wherein the microprocessor comprises software for
6 controlling the receipt, determination, and transmission.

1 9. The positioning apparatus of claim 8, wherein the notification
2 provided is a visible or audible warning to a driver of the towing vehicle.

1 10. The positioning apparatus of claim 8, wherein the software is
2 programmable.

1 11. The positioning apparatus of claim 10, wherein the software
2 comprises a mathematical equation for correlating the direction and the amount
3 of rotation of the actuating wheel to the relative angular position.

1 12. The positioning apparatus of claim 11 wherein the mathematical
2 equation maintains a constant proportionality ratio between the relative angular
3 position and the positioning of a rearview mirror.

1 13. The positioning apparatus of claim 8 wherein the software uses
2 routines or look up tables to correlate the relative angular position with the
3 actuation of the rearview mirror.

1 14. The positioning apparatus of claim 6, wherein the 5th wheel
2 encoder comprises at least one of a conventional spring mechanism, an air
3 spring utilizing compressed air, and a solenoid utilizing electrical current for
4 maintaining a constant force between the rotating device and the towed item.

1 15. The positioning apparatus of claim 1, further comprising a
2 display for showing the relative angular position.

1 16. The positioning apparatus of claim 1, wherein the attachment
2 point is selected from the group consisting of a fifth wheel plate, a ball and
3 hitch mechanism, and a pintle hitch.

1 17. The positioning apparatus of claim 1, wherein the 5th wheel
2 encoder is secured to the attachment point by a mounting flange.

1 18. The positioning apparatus of claim 17, wherein the mounting
2 flange is substantially planar or L-shaped.

1 19. The positioning apparatus of claim 1, further comprising a towed
2 item attached to the towing vehicle at the attachment point, wherein the 5th
3 wheel encoder comprises a rotating device in contact with the towed item.

1 20. The positioning apparatus of claim 19, wherein the rotating
2 device is coupled to an optical encoder, the optical encoder being adapted to
3 detect and transmit to the receiving device the direction and amount of rotation
4 of the rotating device.

1 21. A positioning apparatus for a towing vehicle having a fifth wheel
2 plate attachment point comprising:

3 a towing vehicle having a fifth wheel plate;

4 a towed item attached to the towing vehicle at the fifth wheel plate;

5 a 5th wheel encoder secured to the attachment point, the 5th wheel
6 encoder comprising an actuating wheel being in contact with the towed item for
7 determining an angular position of the towed vehicle relative to the towed item,
8 the actuating wheel mechanically coupled to an optical encoder; and

9 a microprocessor device for receiving the relative angular position from
10 the optical encoder and transmitting information on the relative angular
11 position to a rearview mirror actuating device for controlling the position of a
12 rearview mirror and to a notification device for providing notification of the
13 relative angular positioning.

1 22. A computer-readable medium with executable instructions for
2 performing the steps of:

3 receiving a signal from a sensor, the signal comprising positional
4 variables selected from the group consisting of the relative angular position of a
5 towing vehicle and a towed item, a position of a rearview mirror, a distance
6 from the rearview mirror and an attachment point, and a distance from the
7 attachment point to an axle of a trailer; and

8 correlating the positional variables using at least one of routines and
9 lookup tables.

1 23. The computer-readable medium of claim 22, further comprising
2 performing the step of displaying the relative angular position in degrees or
3 radians.